## CLAIM AMENDMENTS

Please amend the claims as follows:

**1.** - **61.**(*canceled*)

**62.**(*new*) A method of processing colloidal size polytetrafluoroethylene resin particles by plug flow in an unmelted state while in a hydrostatic coalescible condition to produce biaxially-planar oriented structures comprising the steps of:

a. releasing said colloidal size polytetrafluoroethylene resin particles from coagulated dispersion aggregates at high shear in a solvent to create a mixture, wherein said particles are approximately 5 to 10 microns in size and said solvent is capable of wetting polytetrafluoroethylene surfaces;

b. subjecting said mixture to high shear mixing;

c. filtering said mixture to retain approximately 17 to 20 percent liquid to form a hydrostatic pressure coalescible filter cake;

d. uniaxially paste extruding said filter cake composition to produce a uniaxial planar oriented polytetrafluoroethylene structure containing approximately 17 to 20 percent lubricant;

e. applying a means of re-orienting said uniaxially planar oriented polytetrafluoroethylene structure containing approximately 17 to 20 percent lubricant approximately 90 degrees to the initial uniaxial extrusion direction.

**63.**(*new*) The method of claim **62** wherein the means of re-orienting is rolling.

**64.**(*new*) The method of claim **62** wherein the means of re-orienting is calendering.

**65.**(*new*) The method of claim **62** wherein the means of re-orienting is blowing.

**66.**(*new*) The method of claim **62** wherein the means of re-orienting is re-extrusion.

**67.**(*new*) The method of claim **62** wherein said biaxial planar oriented polytetrafluoroethylene structure is a sheet.

**68.**(*new*) The method of claim **62** wherein biaxial planar oriented polytetrafluoroethylene structure is a tube.

**69.**(*new*) The method of claim **68** further comprising steps after step f of:

g. slitting said biaxial planar oriented polytetrafluoroethylene tubular structure; and

h. laying open said structure to form a sheet.

**70.**(*new*) The method of claim **62** further comprising the step after step b of:

c. adding solid particulates approximately less than 25 microns in size during mixing to consist of up to 90 percent of a total solids volume.

**71.**(*new*) A biaxially planar oriented structure formed by releasing said colloidal size polytetrafluoroethylene resin particles from coagulated dispersion aggregates at high shear in a solvent to create a mixture, wherein said particles are approximately 5 to 10 microns in size and said solvent is capable of wetting polytetrafluoroethylene surfaces; subjecting said mixture to high shear mixing; adding solid particulates approximately less than 25 microns in size during mixing to consist of up to 90 percent of a total solids volume; filtering said mixture to retain approximately 17 to 20 percent liquid to form a hydrostatic pressure coalescible filter cake; uniaxially paste extruding said filter cake composition to produce a uniaxial planar oriented polytetrafluoroethylene structure containing approximately 17 to 20 percent lubricant; applying a means of re-orienting said uniaxially planar oriented polytetrafluoroethylene

structure containing approximately 17 to 20 percent lubricant approximately 90 degrees to the initial uniaxial extrusion direction wherein:

said means of re-orienting is rolling.

**72.**(*new*) A biaxially planar oriented structure formed by releasing said colloidal size polytetrafluoroethylene resin particles from coagulated dispersion aggregates at high shear in a solvent to create a mixture, wherein said particles are approximately 5 to 10 microns in size and said solvent is capable of wetting polytetrafluoroethylene surfaces; subjecting said mixture to high shear mixing; adding solid particulates approximately less than 25 microns in size during mixing to consist of up to 90 percent of a total solids volume; filtering said mixture to retain approximately 17 to 20 percent liquid to form a hydrostatic pressure coalescible filter cake; uniaxially paste extruding said filter cake composition to produce a uniaxial planar oriented polytetrafluoroethylene structure containing approximately 17 to 20 percent lubricant; applying a means of re-orienting said uniaxially planar oriented polytetrafluoroethylene structure containing approximately 17 to 20 percent lubricant approximately 90 degrees to the initial uniaxial extrusion direction wherein:

said means of re-orienting is calendering.

**73**.(*new*) A biaxially planar oriented structure formed by releasing said colloidal size polytetrafluoroethylene resin particles from coagulated dispersion aggregates at high shear in a solvent to create a mixture, wherein said particles are approximately 5 to 10 microns in size and said solvent is capable of wetting polytetrafluoroethylene surfaces; subjecting said mixture to high shear mixing; adding solid particulates approximately less than 25 microns in size during mixing to consist of up to 90 percent of a total solids volume; filtering said mixture to retain approximately 17 to 20 percent liquid to form a hydrostatic pressure coalescible filter cake; uniaxially paste extruding said filter cake composition to produce a uniaxial planar oriented polytetrafluoroethylene structure containing approximately 17 to 20 percent lubricant; applying a means of re-orienting said uniaxially planar oriented polytetrafluoroethylene structure containing approximately 17 to 20 percent lubricant approximately 90 degrees to the initial uniaxial extrusion direction wherein:

said means of re-orienting is re-extrusion.

**74**.(*new*) The biaxially planar oriented structure of claim **71** further comprising at least one electrically conductive particulate.

**75**.(*new*) The biaxially planar oriented structure of claim **74** wherein:

said at least one electrically conductive particulate is from a group of carbon, graphite and ceramic oxides.

**76**.(*new*) The biaxially planar oriented structure of claim **71** further comprising:

inert particles.

**77**.(*new*) The biaxially planar oriented structure of claim **72** further comprising:

inert particles.

**78.**(*new*) The biaxially planar oriented structure of claim **73** further comprising:

inert particles.

**79.**(*new*) The biaxially planar oriented structure of claim **71** further comprising polymeric resin particles.

**80.**(*new*) The biaxially planar oriented structure of claim **72** further comprising polymeric resin particles.

**81.**(*new*) The biaxially planar oriented structure of claim **73** further comprising polymeric resin particles.

**82.**(*new*) The method of claim **67** wherein said means of re-orienting is rolling, further comprising a step after step b of:

c. adding solid particulates approximately less than 25 microns in size during mixing to consist of up to 90 percent of a total solids volume; and further comprising a step after step f of:

g. laminating said biaxial planar oriented polytetrafluoroethylene structure by compression.

**83.**(*new*) The method of claim **67** wherein said means of re-orienting is calendering, further comprising the step after step b of adding solid particulates approximately less than 25 microns in size during mixing to consist of up to 90 percent of a total solids volume, further comprising the step after step f of laminating said biaxial planar oriented polytetrafluoroethylene structure by compression.

**84**.(*new*) The method of claim **67** wherein said means of re-orienting is re-extrusion, further comprising the step after step b of adding solid particulates approximately less than 25 microns in size during mixing to consist of up to 90 percent of a total solids volume, further comprising the step after step f of laminating said biaxial planar oriented polytetrafluoroethylene structure by compression.

**85**.(*new*) The method of claim **82** wherein said compression is at a pressure ranging from 100 to 1,000 psi.

**86**.(*new*) The method of claim **83** wherein said compression is at a pressure ranging from 100 to 1,000 psi.

**87**.(*new*) The method of claim **84** wherein said compression is at a pressure ranging from 100 to 1,000 psi.

**88**.(*new*) The method of claim **82** further comprising a step after step h of:

i. applying heat up to 300 degrees Centigrade to plasticize and assist the forming and shaping of the sheet.

**89**.(*new*) The method of claim **83** further comprising a step after step h of:

i. applying heat up to 300 degrees Centigrade to plasticize and assist the forming and shaping of the sheet.

**90**.(*new*) The method of claim **84** further comprising a step after step h of:

i. applying heat up to 300 degrees Centigrade to plasticize and assist the forming and shaping of the sheet.

**91**.(*new*) The methods of claims 63, 64, 65 and 66 and 82 - 90 and 92 - 100 comprising drying and then sintering the fabricated structure at a temperature above 342 not to exceed 400 degrees Centigrade.

**92**.(*new*) Methods of shaping hydrostatic pressure coalescible biaxially planar oriented polytetrafluoroethylene resin sheet structures, containing 17 to 20 percent lubricant, prepared by the process of 62 by the process of claims 63, 64 and 66 and 82 - 90; by deep draw, vacuum and compression; further assisted by the methods of claims 85 - 90.

**93**.(*new*) Deep drawing hydrostatic coalescible sheet containing 17 to 20 percent lubricant; prepared by claims 62, 63 and 66 and 82 - 90; by fastening the sheet to the lip of a porous matched mold cavity and slowly apply pressure to the male component to draw down and conform the sheet to the mold cavity; dry the formed shape and free sinter at 380 degrees Centigrade for 20 minutes; the part is form stable and has a tensile strength of 5000 psi in any planar dimension.

**94**.(*new*) Vacuum forming lubricated sheet prepared by the methods of claims 64, 65 and 66 and 82 - 90 in a porous metal female mold cavity similar to claim 79; the sheet is snuggly fastened to the lip of the mold; a vacuum force applied through the porous metal to force the sheet to conform to the mold geometry; said formed sheet processed further as in 79 with equivalent results.

**95**.(*new*) A method of forming a biaxially planar oriented diaphragm with convex, concave, concentric ribs one inch in depth; in a porous metal matched pair mold; by compressing a sheet of hydrostatic pressure coalescible product of claims 63, 64 or 66 made according to the

method of claim 62; then dried and sintered as in 77; said diaphragms have exceptional flex fatigue life of the order of 10 times that of diaphragms that are not biaxially planar oriented.

**96.**(*new*) Porous biaxially planar oriented polytetrafluoroethylene matrix structures employing the principles of claim 70 employing the fabrication methods of claims 63, 64, 66, 67and 68 and 82 - 90 wherein the particulate components are fugitive and added during claim 70 as part c; said fugitive pore formers are removable by dissolving in water (such as sodium chloride), chemical reaction (such as hydrochloric acid on calcium carbonate) or by thermal decomposition during sintering (such as methyl methacrylate); porosities of up to 90 percent are possible.

**97.**(*new*) Biaxially planar oriented porous structures of claim 96 comprising at least one fugitive pore former.

**98.**(*new*) Biaxially planar oriented porous structures of claim 96 containing a ceramic oxide, carbon or graphite (all electrically conductive materials).

**99.**(*new*) The method of claims 96 and 97 wherein the fugitive pore former additive particle size determines the resulting pore size.

**100.**(*new*) A porous membrane structure of biaxially planar oriented polytetrafluoroethylene of claim 96 wherein the structure contains polymeric particulate additives.

**101.**(*new*) An asymmetric porous structure of biaxially planar oriented polytetrafluoroethylene accomplished during steps d and e of claim 62 employing two different particle size fugitive pore formers as in claims 97 - 99 added in steps d and e of claim 62; processing said composition according to claim 66; concluded by sintering said structure as in claim 91; removing fugitive pore former by leaching or chemical reaction as in claim 96.

**102.**(*new*) Product of 62 biaxially planar oriented with tensile strengths in all planar dimensions essentially equal.

**103.**(*new*) Product of 62 containing solid particulate material homogeneously dispersed and free of a multiplicity of discrete lamellae oriented parallel to faces of processed structure, which may act as planar faults between lamellae.

**104.**(*new*) Improvement of at least 20 percent in the burst strength of biaxially planar oriented tubing processed according to claim 68.

**105.**(*new*) Product made according to claims 82 - 90 and formed by claims 92 - 95, which posses exceptional form and dimensional stability as formed as well as after sintering; shrinkages in the plane of the surface range from 1 to 4 percent; the major shrinkage occurs in thickness, which has little influence on product shape.

**106.**(*new*) Product made according to claim 62 possessing excellent resistance to tear, and a constant rate of elongation with no detectable yield to failure in tension.